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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/713,956  
Filing Date: November 13, 2003  
Appellant(s): CARMELI ET AL.

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Theodore D. Fay III  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed April 30, 2008 appealing from the Office action mailed 10/31/2007.

**(1) Real Party in Interest**

A statement identifying the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

The following is the evidence relied upon in the rejection of claims under appeal.

*Qixiang Sun, Reliable Multicast for Publish/Subscribe Systems, May 2000.*

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102(b) that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-32, 36-51 and 53-54 are rejected under 35 U.S.C. 102(b) as being anticipated by Sun ("Reliable Multicast for Publish/Subscribe Systems").

Regarding claims 1, 17, 36, and 44, Sun anticipates a publish/subscribe messaging system/method (abstract; **dealing with a publish/subscribe message**) comprising: wherein the at least one broker (Figure 3-1; **Logger to check the status of each message as well as the node ID**) has means for sending a status request message to the at least one subscriber (p. 14; **periodically sending heartbeat message to notify of the latest sequence number, thus receiving ACK from one notified is equivalent to sending back the status**),

means, responsive to each subscriber receiving the status request message from the at least one broker, for setting a timer for each subscriber of the at least one

subscriber (at least pp. 30-31, **for each request m for status, the status and existence of ID m is received with in a tick period as a timer**), and

means, responsive to the timer expiring, for sending a multicast message claiming response to the at least one broker from a particular subscriber of the at least one subscriber (pp. 30-31; **if timer – tick period – is expired, a message or a heartbeat will be sent**).

Regarding claims 2, 18, 37, and 45, Sun anticipates the publish/subscribe messaging system of claims 1, 17, 36 and 44, further comprising means for sending a status response message from the particular subscriber to the at least one, wherein the status response message is an indication of liveness of the at least one subscriber (pp. 30-31, **indication of “liveness” and status are disclosed as message sent or heartbeat**).

Regarding claims 3 and 19, Sun anticipates the publish/subscribe messaging system of claim 1, further comprising means for listening on a multicast channel by the at least one broker, and means for determining an indication of non-liveness from failure to receive a response the at least one subscriber (pp. 30-31; **the missing messages indicate of non-liveness for failure**).

Regarding claims 4, 20, 38, and 46, Sun anticipates the publish/subscribe messaging system of claims 2, 18, 37, and 45 wherein the means for sending the status response message from the particular subscriber to the at least one broker further comprises means, responsive to the particular subscriber sending the status response message, for **suppressing** sending of a separate status response message from

another subscriber of the at least one subscriber (Figure 3-3; p. 29, ¶ 2-3; p. 30). Sun further describes situation where only one sender i and receiver j pair is permitted (pp. 29-30).

Regarding claims 5, 21, 39 and 47, Sun anticipates the publish/subscribe messaging system of claims 4, 20, 38, and 46 wherein sending the status response message is responsive to sending the multicast message claiming response, and wherein the means for suppressing sending (p. 15, lines 1-8; Figure 3-3; p. 29, ¶ 2-3; p. 30) further comprise means, responsive to the another subscriber of the least one subscriber receiving the multicast message claiming response, for canceling the timer (p. 43) and discarding the status request message for the another subscriber (section 4.3; p. 40; p. 42).

Regarding claims 6 and 22, Sun anticipates the publish/subscribe messaging system of claims 5 and 21 further comprising means, responsive to the eat least one broker failing to receive the multicast message claiming response from the at least one subscriber, for re-sending the status request message (p. 42, "gossip recovery").

Regarding claims 7 and 23, Sun anticipates the publish/subscribe messaging system of claims 4 and 20 wherein the means for suppressing further comprise: means, responsive to a desired plurality of subscribers of the at least one subscriber sending the status message, for suppressing sending (pp. 29-30) of the status response message from the another subscriber (Figure 3-3).

Regarding claims 8 and 24, Sun anticipates the publish/subscribe messaging system of claims 7 and 23 wherein the status request message comprises a parameter

representative of the desired plurality of subscribers, wherein sending the status response message is responsive to sending the multicast message claiming response, and wherein the means for suppressing sending of the separate status response message from the another subscriber (p. 15, lines 108; pp. 29-30) further comprises: means, responsive to the another particular subscriber receiving the multicast message claiming response from the desired plurality of subscribers, for canceling the timer and discarding (section 4.3) the status request message for the another particular subscriber (pp. 40-41).

Regarding claims 9 and 25, Sun anticipates the publish/subscribe messaging system of claims 1 and 17 wherein the timer has a random duration (p. 15, lines 1-8, "randomizing the delays").

Regarding claims 10 and 26, Sun anticipates the publish/subscribe messaging system of claims 1 and 17 further comprising: means for maintaining an active connection between the particular subscriber and the at least one broker, wherein the active connection is established during registration, (abstract; Figure 3-1; p. 15, last ¶), and means for indicating liveness to the at least one broker using the active connection (abstract; Figure 3-1; p. 15, last ¶).

Regarding claims 11 and 27, Sun anticipates the publish/subscribe messaging system of claims 10 and 26. See discussions of claims 1-3 and 17-19 above.

Regarding claims 12 and 28, Sun anticipates the publish/subscribe messaging system according to claims 1 and 17, wherein the at least one broker is arranged to designate as a first subscriber to register interest in a topic (p. 13) as a primary

subscriber, and to maintain an active connection to the primary subscriber for sending the status request message directly to the primary subscriber, and to designate (p. 43) a different subscriber as a new primary subscriber in response to a failure of the primary subscriber to send an indication of liveness and in response to the different subscriber sending the indication of liveness (p. 43).

Regarding claims 13 and 29, Sun anticipates the publish/subscribe messaging system of claims 10 and 26 wherein the active connection is a TCP/IP connection (Figure 3-1).

Regarding claims 14 and 30, Sun anticipates the publish/subscribe messaging system of claims 1 and 17 wherein the status request message is piggybacked onto another multicast publication message (p. 15, ¶ 1).

Regarding claims 15 and 31 Sun anticipates the publish/subscribe messaging system of claims 1 and 17 wherein the indication of liveness is sent over one of: a UDP connection (Figure 3-1); and a TCP connection (Figure 3-1). It is inherent that an Internet connection encompasses UDP and TCP connections.

Regarding claims 16 and 32 Sun anticipates the publish/subscribe messaging system of claims 15 and 31 wherein the connection over which the indication of liveness is sent (Figure 3-1) is arranged to escalate autonomously from a UDP connection in response to an absence of responses to the at least one broker within a chosen time period (p. 43).

Regarding claim 40, Sun anticipates the system of claim 38, wherein the means for suppressing further comprises: means, responsive to a desired plurality of



subscribers of the at least one subscriber sending of the status response message is arranged to suppressing sending of the separate status response message from the another subscriber (p. 15, "suppressing").

Regarding claim 41, Sun anticipates the system of claim 40 wherein the status request message comprises representative of the desire plurality of subscribers, wherein sending the status response message comprises is responsive to sending the multicast message claiming response (Figure 3-1), and wherein the means for suppressing sending of the separate status response message from the another subscriber further comprises: means, responsive to the another particular subscriber receiving the multicast message claiming response from the desired plurality of subscribers, for canceling the timer and discarding the status request message (p. 43) for another particular subscriber (p. 43).

Regarding claim 42, Sun anticipates the system of claim 36 further comprising: means for maintaining an active connection between the particular subscriber and the broker, wherein the active connection is established during registration (p. 13, Figure 3-1); and means for indicating liveness to the broker using the active connection (p. 43).

Regarding claim 43, see discussion of claim 36 in reference with claims 11 and 27.

Regarding claim 48, Sun anticipates the method of claim 46 wherein the suppressing further comprises: responsive to a desired plurality of subscribers of the plurality of subscribers sending the status response message, suppressing sending of the separate status response message from another subscriber (p. 15).

Regarding claim 49, Sun anticipates the method of claim 48, wherein the status request message comprises a parameter representative of the desired plurality of subscribers, wherein sending the status response message is responsive to sending the multicast message claiming response, and wherein suppressing sending of the separate status response message from the another subscriber further comprises: (p. 15, "suppressing"): responsive to the another subscriber receiving the multicast message claiming response from the desired plurality of subscriber, canceling the timer and discarding the status request message fro the another subscriber (p. 43).

Regarding claim 50, Sun anticipates the method of claim 44 further comprising: maintaining an active connection between the particular subscriber and the broker, wherein the active connection is established during registration (abstract; Figure 3-1; p. 15, last ¶); and indicating liveness to the broker using the active connection (Figure 3-1).

Regarding claim 51, Sun anticipates the method of claim 50 further comprising: sending a status response message from the particular subscriber to the broker to indicate the liveness (Figure 2-2), responsive to the particular subscriber sending the status response message suppressing sending of a separate status response message from another subscriber, and wherein the suppressing further comprises: responsive to determining that the particular subscriber has the active connection to the broker, performing one of sending the status response message to the broker via the active connection (section 4.1), and the multicast message claim response and the status

response message to the broker via the active connection upon the expiry of the timer (Figure 4-1

Regarding claim 53, Sun anticipates the method of claim 17, further comprising: responsive to sending the multicast message claiming response and responsive to an absence of an active connection between the particular subscriber and the at least one broker, establishing the active connection to the at least one broker and sending a status response message to the at least one broker via the active connection (section 4.1).

Regarding claim 54, Sun anticipates the publish/subscribe messaging system of claim 1, further comprising: responsive to sending the multicast message claiming response and responsive to an absence of an active connection between the particular subscriber and the at least one broker, establishing the active connection to the at least one broker and sending a status response message to the at least one broker via the active connection (section 4.1).

#### **(10) Response to Argument**

**I (Issue):** Did the Examiner err in concluding that claims 1-32, 36-51 and 53-54 were rejected under 35 U.S.C. § 102(b) as being anticipated by Sun (*Reliable Multicast for Publish/Subscribe Systems*, May 2000).

- In the first argument, the Appellant states “*Sun does not anticipate Claim 17 because Sun does not disclose each and every feature of Claim 17. For example: Specifically... Sun fails to disclose the feature of responsive to the timer expiring,*

*sending a multicast message claiming response to the at least one broker from a particular subscriber of the at least one subscriber. Appellants' Response to Office Action, page 17. Responsive to this fact, the final Office Action states:: In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e. responsive to the timer expiring) is read as existing a time t in the execution (p. 43, last Para.) of gossiping for response message in Sun. Final Office Action, page 2, paragraph 3. The Office Action's assertions are incorrect. Sun discloses a liveness condition monitoring protocol that uses a hybrid Publish/Subscribe messaging system that combines a logger based protocol with a gossip-based protocol. The hybrid protocol implements an acknowledgement system known as garbage collected notification rather than using timers and timeouts. However, contrary to the Office Action's assertion, nothing in Sun teaches or fairly suggests the use of timers. Indeed, the "time" that is referenced in Sun has no bearing on a timer expiration. Rather, the "time" in Sun refers to a time period in execution. By contrast, Appellants claim, "responsive to each subscriber receiving the status request message from the at least one broker, setting a timer for each subscriber of the at least one subscriber," and "responsive to the timer expiring, sending a multicast message claiming response to the at least one broker from a particular subscriber of the at least one subscriber." These explicitly recited claim features require the use of a timer expiring, which is entirely distinct from the time in execution as disclosed in Sun. Therefore, the attempt to map the elements of*

*Appellants' claims, which include conditions that require the setting and expiration of a timer, to Sun, which has nothing to do with timers, constitutes factual and legal error. In fact, Sun does not teach these claimed features. Accordingly, under the standards of In re Bond, the cited reference does not anticipate claim 1 or any other claim in this grouping of claims. Therefore, the Board should reverse the rejection.*

In the first argument, the Appellant's argument has not been found to be persuasive. In fact, the Examiner has previously pointed out that there is a time *t* being set up on receiving the request status in Sun that taught a timer expiration similar to "responsive to timer expiring" as invention claimed (see pp. 30-31). "After a time *t*" indicates the timer is expiring. In addition, the "existing a time *t* in the execution" in according with conditions is equivalent to timer as invention claimed to responsive to timer expiring (see Figure 4-1 for the timer *T*).

- In the second argument, the Appellant states "*nowhere in Sun is there a disclosure, either express or inherent, regarding Appellants' recited claim feature, 'responsive to each subscriber receiving the status request message from the at least one broker, setting a timer for each subscriber of the at least one subscriber.'*" Nevertheless, the Office Action maps this recited claim limitation to Sun at page 43. The cited passage in Sun at page 43 states in pertinent part: •  
*Property 4.1 For each missing message m, m is either recovered during the gossip phase or eventually passed on to the logger phase recovery. The first half of the claim is obvious from construction. To show the second half of the claim,*

*we note that local garbage collection of  $m$  will eventually occur. In other words, there exists a time  $t$  in the execution such that  $m \in E_{\text{gossipbuf}}$  for all  $i$  and time after  $t$ . Therefore, after time  $t$ , periodic gossip messages for retransmission of  $m$  will eventually result in the arrival of a corresponding GcNOTE message and removal of the ID from  $g\text{missing}$  as desired. (emphasis added). Sun does not mention a timer or the expiration of a timer, let alone the complete claim recitation of "responsive to the timer expiring, sending a multicast message claiming response to the at least one broker from a particular subscriber of the at least one subscriber." Neither can the existence of a timer be inferred from the passage in Sun at page 43 as asserted in the final Office Action. Nowhere in Sun does there exist a disclosure regarding the setting of a timer, let alone Appellants' recited conditional claim limitation of, "responsive to each subscriber receiving the status request message from the at least one broker, setting a timer for each subscriber of the at least one subscriber.*

In the second argument, the Appellant's argument has not been found to be persuasive. Sun discloses a time  $t$  in Sun that functions as a timer expiration similar to "responsive to timer expiring" as invention claimed (see pp. 30-31). "After a time  $t$ " indicates the timer is expiring. In addition, it's predictable that setting an existing time  $t$  in the execution to be responsible for each subscriber is predictable to receive the status request message from the at least one Logger and being set a timer  $t$  for each subscriber of the at least one subscribe in according with conditions is equivalent to timer as invention claimed (see Figure 4-1 timer; p. 34). Thus, a time  $t$  being set up on

receiving the request status reads on setting a timer to each subscriber accordingly when receiving the request multicast message from the publisher.

- In the third argument, the Appellant states *"Sun does not anticipate claims 5, 8, 21, 24, 39, 41, 47, and 49. Additionally, Sun does not anticipate claim claims 5, 8, 21, 24, 39, 41, 47, and 49. Claim 21 is a representative claim of this grouping of claims. Claim 21 is as follows: 21. The method of claim 20, wherein sending the status response message is responsive to sending the multicast message claiming response, and wherein the suppressing further comprises: responsive to the another subscriber of the least one subscriber receiving the multicast message claiming response, cancelling the timer and discarding the status request message for the another subscriber. Claim 21 depends from claim 17. Therefore, at least for the reasons given above, Sun also does not anticipate claim 21. Furthermore, Sun does not teach the additional features of claim 21. Sun teaches the condition upon which a GcNOTE (garbage collection notification) will be generated. Sun also states that this portion of Sun completes the description of hybrid protocol rpbcast. However, Sun is utterly devoid of canceling a timer, as asserted by the Examiner. The disclosure simply does not exist. Therefore, Sun does not anticipate claim 21 or any other claim in this grouping of claims. Sun also does not teach canceling a timer responsive to the another subscriber of the least one subscriber receiving the multicast message claiming response. Thus, again, Sun does not anticipate claim 21 or any other*

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*claim in this grouping of claims. Sun also does not teach, "discarding the status request message for the another subscriber," as required by claim 21.*

In the third argument, the Appellant's argument has not been found to be persuasive. The timer *t* as taught by Sun (Figure 4-1) for gossiping recovery is to be reset for each *tick* if a response is not receiving, and if a response is received the timer *t* is no longer set to wait for another response (see programming language scripts, p. 34). Thus, it is predictable that the timer *t* setting in according with a status response taught by Sun could perform the same function as claimed by the instant application.

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Tuan Khanh Phan GAU2163

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